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Objective record of *Pterois russelii* (Scorpaenidae: Pteroinae) from the Red Sea

by

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Résumé. – Signalement objectif de *Pterois russelii* (Scorpaenidae: Pteroinae) en mer Rouge.

Un seul spécimen de *Pterois russelii*, collecté à Jizan, en Arabie Saoudite, confirme le précédent signalement sans preuve de cette espèce en mer Rouge. Des comparaisons de *P. russelii* avec ses congénères de la mer Rouge sont fournis.

Keywords. – Scorpaenidae - *Pterois russelii* - Lionfish - Saudi Arabia - Distribution - Morphology.

The Plaintail Turkeyfish *Pterois russelii* Bennett, 1831, one of the twelve valid species of the genus (Matsunuma and Motomura, 2014, 2015), has been recorded from many Indo-West Pacific localities, from the East coast of Africa eastward to Australia and northward to Taiwan (Smith, 1957; Poss, 1999). Frøiland (1972), in an unpublished PhD dissertation from the University of Bergen, Norway, recorded the species from the Red Sea on the basis of a single specimen [TAU (Tel Aviv University, Israel) NS 1114] collected from Eilat, Gulf of Aqaba, Israel. Although his description of the Eilat specimen agreed with features of *P. russelii* (see Remarks), that specimen could not be found in the TAU collection and is apparently missing (M. Goren, pers. com.), making confirmation of its identity impossible. Although Dor (1984) and Goren and Dor (1994) followed Frøiland (1972) by including *P. russelii* in their checklists of Red Sea fishes, Golani and Bogorodsky (2010), in their comprehensive checklist of Red Sea fishes, considered Frøiland's (1972) record of *P. russelii* to be a misidentification of *Pterois miles* (Bennett, 1828). Subsequently, Debelius (1998), in his field guide to the animals of the Red Sea and adjacent waters, stated that *P. russelii* is distributed in the Arabian and Red seas, although his photograph of the species was taken from the Gulf of Oman. Accordingly, no records of *P. russelii* from the Red Sea are supported by currently available specimens. A single specimen of *P. russelii* (Fig. 1), recently collected off Jizan, Saudi Arabia, is therefore described herein, being confirmation of the species occurrence in the Red Sea.

MATERIALS AND METHODS

Measurements generally followed Motomura (2004b, c), with

head width, head depth, maxillary depth and body depth at the anal-fin origin following Motomura (2004a), Motomura *et al.* (2005b, 2006a, b), and Matsunuma *et al.* (2013), respectively. Counts generally followed Motomura *et al.* (2005a-c) and Motomura and Johnson (2006); predorsal scale and cheek scale counts followed Motomura *et al.* (2006b) and Matsunuma and Motomura (2013), respectively. The last two soft rays of the dorsal and anal fins were counted as single rays. Counts and measurements were made on the left side wherever possible, except for pectoral-fin rays (counted on both sides). Head spine terminology follows Randall and Eschmeyer (2002: fig. 1), Motomura (2004c: fig. 1), and Matsunuma and Motomura (2014: fig. 1). Supplemental preopercular spine and lateral lacrimal spine terminology follows Eschmeyer (1965) and Motomura and Senou (2008: fig. 2), respectively. Standard length is abbreviated as SL. The description of *P. russelii* was based on the Red Sea specimen, data from non-Red Sea specimens being used for comparisons. Records from the Red Sea only are cited in the synonym list of *P. russelii*. Institutional abbreviations follow Sabaj Pérez (2014), with the following addition: Marine Biology Department, Faculty of Marine Sciences, King Abdulaziz University, Jeddah, Saudi Arabia (KAU).

Comparative materials examined. – *Pterois antennata*: 96 specimens (14.0–153.9 mm SL) listed in Matsunuma and Motomura (2014, 2015). *Pterois cincta*: 31 spms (47.1–159.4 mm SL) listed in Matsunuma and Motomura (2015) with the following addition: TAU 4006, 93 mm SL, Eilat, Israel, 1960 (photograph and fin ray counts examined). *Pterois miles*: 17 spms (65.4–282.9 mm SL): **Thailand**: KAUM-I. 33255, 151.1 mm SL; KAUM-I. 33256, 167.0 mm SL; KAUM-I. 33375, 95.4 mm SL; PMBC 3397, 173.3 mm SL; PMBC 20209, 71.7 mm SL; PMBC 20901, 65.4 mm SL; PMBC 25198, 161.0 mm SL. **Indonesia**: NCIP (uncat.), 120.2 mm SL; NCIP 2734, 190.0 mm SL. **Reunion**: MNHN 6598, 247.2 mm SL, syntype of *Pterois muricata* Cuvier in Cuvier & Valenciennes, 1829. **Saudi Arabia**: SMF 34717, 134.2 mm SL. **Indian Ocean** (cited locality unknown): MZS Pis502, 92.1 mm SL; MZS Pis3394, 114.5 mm SL. **Red Sea** (cited locality unknown): MNHN 6597, 282.9 mm SL, syntype of *P. muricata*; ZMB 791, 121.3 mm SL; ZMB 800, 251.6 mm SL. **Doubtful locality**: FMNH 18067, 139.1 mm SL (Samoa). *Pterois mombasae*: 35 spms (26.1–160.1 mm) listed in Matsunuma and Motomura (2014, 2015). *Pterois russelii*: 122 spms (44.2–240.7 mm SL): **Taiwan**: ASIZP 61498, 87.3 mm SL; ASIZP 61877, 77.0 mm SL; ASIZP 64781, 144.5 mm SL; ASIZP 64895, 178.9 mm SL; ASIZP 64899, 108.8 mm SL; ASIZP 64949, 123.1 mm SL; FMNH 89152 (2 spms), 109.0–137.0 mm SL; HUMZ 4958, 149.5 mm SL; HUMZ 80661, 82.0 mm SL; HUMZ 80662, 124.0 mm SL; HUMZ 80663,

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Figure 1. – Fresh specimen of *Pterois russelii* from the Red Sea [SMF 35752 (KAU 14-168), 99.7 mm standard length, off Jizan, Saudi Arabia]. Photo by S. V. Bogorodsky.

68.5 mm SL; HUMZ 80664, 74.9 mm SL; HUMZ 80665, 67.1 mm SL; KAUM-I. 39215, 132.5 mm SL; KAUM-I. 39216, 137.0 mm SL; KAUM-I. 39217, 118.4 mm SL; KAUM-I. 39218, 150.6 mm SL; KAUM-I. 39219, 130.4 mm SL; KAUM-I. 39221, 128.0 mm SL; KAUM-I. 39222, 101.8 mm SL; KAUM-I. 39223, 134.9 mm SL; KAUM-I. 39224, 137.8 mm SL; KAUM-I. 39226, 120.1 mm SL; NMMB-P 4241, 193.1 mm SL; NMMB-P 4246 (2), 179.4–189.3 mm SL; NMMB-P 5069, 86.2 mm SL; NTUM 1421 (2), 189.4–217.5 mm SL; NTUM 3314, 199.5 mm SL; NTUM 3458, 172.8 mm SL; NTUM 3459, 240.7 mm SL; NTUM 3460, 144.7 mm SL; NTUM 3461, 169.8 mm SL; NTUM 3462, 142.2 mm SL; NTUM 3464, 72.4 mm SL; NTUM 6926, 125.0 mm SL; NTUM 7693, 85.2 mm SL. **China:** NMW 98236, 151.3 mm SL; NSMT-P 54635, 167.1 mm SL; NSMT-P 69324, 44.2 mm SL; NSMT-P 70043, 180.2 mm SL. **Gulf of Tonkin:** FAKU 100040, 172.4 mm SL; FAKU 100041, 191.2 mm SL; FAKU 100049, 171.6 mm SL. **Vietnam:** HUMZ 190454, 146.0 mm SL; HUMZ 190607, 78.6 mm SL; MNHN 6569, 207.1 mm SL; NSMT-P 69332, 64.1 mm SL. **Thailand:** KAUM-I. 23103, 157.2 mm SL; KAUM-I. 32890, 113.9 mm SL; NMW 9222, 98.0 mm SL; NSMT-P 56795, 161.2 mm SL; PMBC 9933, 59.2 mm SL. **Malaysia:** FMNH 76285 (2), 57.0–64.5 mm SL; FMNH 76286, 140.8 mm SL; HUMZ 37740, 190.4 mm SL; HUMZ 37801, 113.8 mm SL; HUMZ 37827, 150.5 mm SL; HUMZ 38417, 206.1 mm SL; HUMZ 38419, 175.3 mm SL; HUMZ 38440, 144.5 mm SL; HUMZ 38446, 207.2 mm SL; HUMZ 38450, 137.9 mm SL; HUMZ 38473, 125.3 mm SL; HUMZ 38515, 206.5 mm SL; HUMZ 38516, 159.6 mm SL; HUMZ 38565, 221.9 mm SL; HUMZ 38624, 148.8 mm SL; HUMZ 46851, 205.1 mm SL; HUMZ 46871, 104.4 mm SL; HUMZ 46928, 160.6 mm SL; HUMZ 46929, 188.9 mm SL; HUMZ 46934, 145.4 mm SL; HUMZ 47043, 170.6 mm SL; HUMZ 47067, 196.6 mm SL; KAUM-I. 16926, 141.5 mm SL; NMW 98220, 153.0 mm SL. **Philippines:** ZUMT 39596, 154.1 mm SL. **Indonesia:** BMNH 1880.4.21.108, 121.4 mm SL, syntype of *Pterois kodipungi* Bleeker, 1852; RMNH 5868 (11), 54.2–177.0 mm SL, syntype of *P. kodipungi*; NMW 28219 (2), 60.9–139.5 mm SL; NMW 98223, 150.1 mm SL; RMNH 662, 128.3 mm SL; NMW 98237 (3), 79.3–110.5 mm SL; ZMB 17750, 113.5 mm SL. **Singapore:** NMW 22306 (2), 125.2–132.7 mm SL; NMW 98235, 123.8 mm SL. **South China Sea:** HUMZ 13880, 160.6 mm SL. **Myanmar:** MNHN 6558, 180.4 mm SL, holotype of *Pterois geniserra* Cuvier in Cuvier and Valenciennes, 1829; PMBC 25199, 147.3 mm SL. **India:** MNHN 7440, 184.1 mm SL; NMW 98221, 87.3 mm SL; ZMB 10847, 142.1 mm SL; ZSI 3452/1, 141.9 mm SL; ZSI 11548-51 (4), 100.5–122.2 mm SL. **Madagascar:** AMS I. 28128-001, 159.7 mm SL; MNHN

1998-1495, 112.6 mm SL. **Locality unknown:** HUMZ 33638, 166.7 mm SL; HUMZ 33639, 196.1 mm SL; NCIP 2956, 110.2 mm SL.

Pterois russelii Bennett, 1831
(Fig. 1)

Pterois russelii Bennett, 1831: 128 (Coromandel coast, India, eastern Indian Ocean; no types preserved); Frøiland, 1972: 80 (Eilat, Israel, Red Sea); Dor, 1984: 86 (Red Sea; listed); Goren and Dor, 1994: 21 (Red Sea; listed).

Material examined

SMF 35752 (KAU 14-168), 99.7 mm SL, off Jizan, Saudi Arabia, Red Sea (16°58.569'N, 42°20.764'E), over soft substrata, 30–32 m, S.V. Bogorodsky *et al.*, bottom trawl, 1 Nov. 2014.

Description

Dorsal-fin rays XII, 11 (abnormal condition; usually XIII, 11 in the species; see Remarks); anal-fin rays III, 7; pectoral-fin rays 13 (both sides); pelvic-fin rays I, 5. Pored lateral-line scales 28; scale rows in longitudinal series 72; scales above lateral line 10; scales below lateral line 14; scale rows between last dorsal-fin spine base and lateral line 9; scale rows between sixth dorsal-fin spine base and lateral line 8; predorsal-fin scale rows 4; oblique cheek scale row 6; horizontal cheek scale row 3; vertical cheek scale row 4. Gill rakers 5 + 11 (2 rakers on hypobranchial). Branchiostegal rays 6. The following morphometrics are expressed as percentage of SL: body depth at pelvic-fin origin 33.2; body depth at anal-fin origin 28.1; body width 20.9; head length 38.1; head width 11.0; head depth 15.1; snout length 13.7; interorbital width at mid-orbit level 9.0; interorbital width at preocular spine base 7.6; upper-jaw length 6.3; maxillary depth 6.0; postorbital length 18.5; suborbital depth 4.7; predorsal-fin length 32.3; preanal-fin length 69.2; prepelvic-fin length 37.8; caudal-peduncle length 19.1; caudal-peduncle depth 11.2; first dorsal-fin spine length (DS) 19.2; second DS 28.9; third DS broken; fourth DS 36.8; fifth DS 36.2; sixth DS 38.2; seventh DS 38.2; eighth DS 36.7; ninth DS 34.7; tenth DS 26.2; eleventh DS 16.4; twelfth DS 15.3; first dorsal-fin soft ray length 21.0; longest dorsal-fin soft ray length 36.5 (fourth); first anal-fin spine

length (AS) 7.8; second AS 13.7; third AS 17.0; first anal-fin soft ray length 32.2; longest anal-fin soft ray length 38.4 (third); first pectoral-fin ray length 103.1; pelvic-fin spine length 19.1; longest pelvic-fin soft ray length 51.9 (second); caudal-fin length 48.6.

Body oblong, moderately compressed; depth moderate, slightly less than longest dorsal-fin spine length. Caudal peduncle relatively short, low, its depth less than its length. Head large, its length greater than body depth. A pair of short barbels on tip of snout, the length of barbel subequal to anterior nostril flap. A short, pointed flap with a median expansion on posterior edge of low membranous tube associated with anterior nostril. Supraocular with a moderately long tentacle with wavy lateral ridges, its length 1.2 times orbit diameter. Two small elongate, leaf-like flaps on preopercle margin below third preopercular spine base; upper and lower flaps on tips of fourth and fifth preopercular spine, respectively. An extremely small skin flap anterodorsally on orbit surface; its length shorter than anterior nostril diameter. Two elongate, leaf-like flaps on ventral margin of lacrimal; anterior and posterior flaps on tips of anterior and posterior lacrimal spine, respectively; posterior flap relatively long (its length 1.5 times anterior flap length), its tip extending beyond posterior margin of maxilla when laid back. Head and body covered with small cycloid scales (ctenoid scales absent); snout, both jaws, mandible, lacrimal, interopercular and occipital area without scales. Suprapostorbital region bordered by pterotic, posttemporal and parietal-nuchal spine base generally naked but with few small scattered cycloid scales.

Mouth moderately large, slightly oblique, forming an angle of ca. 30° to horizontal axis of head. Anterior region of maxilla with a poorly developed median lateral ridge; upper edge of posterior maxilla swollen laterally, forming a low ridge; posterior margin of maxilla broadly rounded, just reaching level with anterior margin of pupil. Symphyseal gap separating premaxillary teeth bands broader than width of each band; both jaws with a narrow band of small, slender conical teeth; about 6-8 and 7 tooth rows at widest portion of upper and lower teeth bands, respectively; small conical teeth forming blunt V-shaped patch on vomer, about 6 tooth rows at widest portion; palatine teeth absent. Underside of dentary with three sensory pores on each side, middle pore presented by complex of three minute pores; two small pores on each side of symphyseal knob of lower jaw on each side. Gill rakers on first gill arch short, tips slightly expanded.

Dorsal profile of snout moderately steep, forming an angle of ca. 40° to horizontal axis of head. Nasal spine single. Preocular spine with a spinous point directed dorsally. Supraocular spine with a spinous point covered by base of supraocular tentacle. Postocular spine large with a spinous point directed laterally (absent on right side). Interorbital ridge poorly developed, diverging anteriorly and posteriorly in dorsal view; interorbital canal narrow, shallow. Coronal and tympanic spines absent. Parietal with a single ridge with a spinous point on posterior end. Nuchal with a single ridge completely fused to parietal ridge, with a single spinous point on posterior end. Occipital area shallow, undeveloped. Postorbital spine absent. Sphenotic region with one (two on right side) small spine. Pterotic, lower posttemporal and cleithrum with a short ridge with a small spine. Lateral lacrimal ridge short, without spine. Suborbital ridge divided into anterior and posterior portions, end of each portion with a spinous point. Anterior lacrimal spine with a single spinous point, directed ventrally. Posterior lacrimal portion plate-like with a spinous point distally. Preopercle with four (five) spines, upper three (two) spines prominent, lower two spines reduced and skin-covered; no supplemental spine. Opercular spine absent.

Dorsal-, anal- and pelvic-fin spines with deep grooves (most likely associated with venom glands). Origin of first dorsal-fin

spine above pterotic spine base; bases of first and second dorsal-fin spines closer than those of subsequent adjacent spines; sixth or seventh spine longest; interspinous membranes of dorsal fin deeply incised. All but first dorsal-fin ray branched; fourth ray longest, its length distinctly less than that of longest dorsal-fin spine; posteriormost ray free from caudal peduncle. Origin of first anal-fin spine below last (twelfth) dorsal-fin spine base; third spine longest. Anal-fin soft rays all branched; third ray longest, its length slightly longer than that of longest dorsal-fin soft ray; posteriormost ray free from caudal peduncle. Pectoral fin extremely long, its length greater than SL, its tip far beyond level of caudal-fin base; membranes incised, but reaching along rays to tips; lower four rays slightly thickened. Pelvic-fin spine base below second dorsal-fin spine base; all soft rays branched; second soft ray longest, its tip reaching level of fifth anal-fin soft ray base when laid along body; posteriormost soft ray with membranous connection to abdomen for approximately one-fifth of ray length. Caudal fin moderately long, its length 1.3 times head length, with rounded contour; three (dorsal series damaged) procurent rays, two (dorsal series damaged) segmented unbranched rays, and five segmented branched rays in dorsal and ventral series.

Colour of fresh specimen (based on figure 1). – Ground colour of head and body whitish with pale red tinge, more whitish ventrally. Snout side with two narrow brown bands, anterior band running along bulge on snout, posterior band from preocular, extending onto anterior lacrimal flap. Three bars below eye: anteriormost bar narrow, orange, reaching from anteroventral margin of orbit to posterior lacrimal flap base; middle bar relatively broad, somewhat orange-brown, reaching from supraocular tentacle base, across orbit ventrally, to posteroventral margin of preopercle; posteriormost bar narrow, pale orange, reaching from posteroventral margin of orbit to posterior margin of preopercle. Four orange to brown bands saddling nape, extending onto opercle: anteriormost band brown, curved, relatively broad at level of occipital region; second band paler, at level of origin of parietal-nuchal spine base; third band brown, broad at level of central portion of parietal-nuchal ridge; posteriormost band paler, narrower below parietal-nuchal spine base. Supraocular tentacle and orbit surface flap black; other skin flaps on head same as head ground colour. Eye vivid yellow (iris tinged with red by blood); pupil dark blue. Twelve or more (uncertainty due to damage posteriorly on body) transverse brown bars on body side, alternating broad and narrow. Body bars extending basally onto dorsal and anal fins. Thorax without band markings. A few small, poorly defined, white spots scattered along lateral line. A large, irregular, rounded blotch (slightly larger than pupil) behind dorsoposterior margin of the opercle. Dorsal-fin ray coloration similar to ground colour of body, membrane more reddish; soft-rayed portion without any distinct marking but a minute black spot on membrane between first and second rays. Anal-fin coloration similar to that of dorsal fin but dusky distally, with a few small white rounded blotches basally; three minute black spots scattered on soft-rayed portion. Pectoral-fin coloration similar to that of ground colour of body, membrane of upper and posterior portion of fin strongly blackish, with about seven poorly defined bands. Pelvic-fin spine white, soft rays and membrane black, with numerous small white rounded to oval spots (smaller than iris). Caudal-fin coloration faded due to specimen condition, without spots.

Remarks

The examined specimen agreed with descriptions and figures of *P. russellii* given in previous studies (Smith, 1957; Poss, 1999; Matsunuma, 2011, 2013) in having III, 7 anal-fin rays; 13 pectoral-fin rays; 72 scale rows in longitudinal series; coronal and tym-

panic spines absent; the head and body not covered with ctenoid scales; the soft-rayed portion of the dorsal and anal fins and caudal fin without numerous spots, being distinct rows; and the pelvic fin with numerous white spots. Although the specimen unusually possessed 12 dorsal-fin spines, 13 being normal for the species, the former is regarded as an abnormal condition with no further significance. The specimen, relatively small in size of 99.7 mm SL, possessed well developed supraocular tentacles, of length 120% of orbit diameter, whereas large specimens recorded in previous studies (e.g., Smith, 1957: 24.5 cm total length specimen from South Africa; Randall, 1995: 34 cm specimen from Oman) possesses either reduced supraocular tentacles or none at all. Examination of the Red Sea and other examined specimens of *P. russelii* indicated that the supraocular tentacles become reduced and shorter with growth in the species (Fig. 2). The Red Sea specimen was collected by trawl off Jizan from depths of 30–32 m over soft substrata far from coral reefs and islands, typical habitat of *P. russelii*, which is rarely seen close to coral reefs.

Only three species of *Pterois* were listed by Goren and Dor (1994) in their checklist of Red Sea fishes: *P. miles*, *P. radiata* Cuvier in Cuvier & Valenciennes, 1829, and *P. russelii*. Later, Matsunuma and Motomura (2015) concluded that *P. radiata* in the Red Sea was in fact the closely related species *Pterois cincta* Rüppell, 1838, the latter having long been included in the synonymy of the former. Although Debelius (1998) reproduced an underwater photograph of *Pterois mombasae* (Smith, 1957) from Jordan, that was subject to a locality error (D. Golani, pers. com.). Among the congeners occurring in the Red Sea, *P. russelii* most resembles *P. miles* in general body appearance, both species sharing a large body (exceeding 20 cm), the orbit highly set on the head (and broadly separated from the suborbital ridge) and the upper pectoral-fin rays neither filamentous nor free from membranes. However, *P. russelii* can be distinguished from *P. miles* in having more dorsal-fin [10–12 (strongly modally 11) versus 9–11 (10) in the latter] and anal-fin soft rays [6–8 (7) versus 6 (rarely 5)], and slightly fewer pectoral-fin

rays [12–14 (13) versus 13 or 14 (14)] (Schultz, 1986; this study). Moreover, *P. russelii* differs from *P. miles* by having slightly fewer scale rows in the longitudinal series (69–91 versus 79–96 in the latter) and scale rows below the lateral line (13–20 versus 17–23), but those counts also overlapped. Coloration is the most useful feature for separating the two species, *P. russelii* possessing a plain caudal fin and the soft-rayed portion of the dorsal and anal fins without spots (rarely a few spots present), whereas those fins had numerous rounded dark spots, forming distinct rows in *P. miles* (Poss, 1999; this study). *Pterois cincta*, also endemic to the Red Sea, is readily distinguishable from *P. russelii* by having 15 or more pectoral-fin rays (versus 12–14 in the latter), 51–57 scale rows in the longitudinal series (versus 69–91), the orbit close to the suborbital ridge (versus well separated) and the upper pectoral-fin rays with short associated membrane and filamentous (versus not filamentous or free from membrane) (Smith, 1957; Matsunuma and Motomura, 2014, 2015; this study).

The record of *P. russelii* from the Red Sea (Eilat, Israel) in Frøiland (1972) was supported by a drawing of that species. However, the latter was reproduced from Smith (1957: fig. 6) and not based on the examined specimen (TAU NS 1114, 146.0 mm SL), which was characterized as follows: XIII, 11 (as XIII + 11 1/2) dorsal-fin rays; 13 pectoral-fin rays; III, 7 (as III + 7 1/2) anal-fin rays; and 88 scale rows in the longitudinal series under “Material examined”. However, the “Description” included: dorsal-fin rays XIII, 11 (10–12); anal-fin rays III, 7(8); pectoral-fin rays 13 (12–14); and scale rows in the longitudinal series 70–88, clearly indicating either a number of specimens examined or published data included, as opposed to a single specimen. Notwithstanding, the number of fin rays given specifically for the Eilat specimen agreed with those of *P. russelii* rather than *P. miles*. Moreover, Frøiland (1972) described that specimen as possessing a few spots on the caudal-fin and soft-rayed portions of the dorsal and anal fins, features consistent with *P. russelii*. Accordingly, Frøiland’s (1972) specimen can be identified as having been *P. russelii*. Although a second specimen (TAU 4006) from Eilat had previously also been identified as *P. russelii*, it is now recognized as *P. cincta*, having XII, 10 dorsal-fin rays, III, 6 anal-fin rays and 17 pectoral-fin rays. Therefore, the specimen described herein represents the sole currently available example of *P. russelii* from the Red Sea. Occasional records of *P. russelii* in the Red Sea might be explained by its typical habitat in open areas with silty sand bottom rarely visited by divers, in contrast to *P. cincta* and *P. miles* usually inhabiting coral reefs (Allen and Erdmann, 2012; Matsunuma and Motomura, 2015).

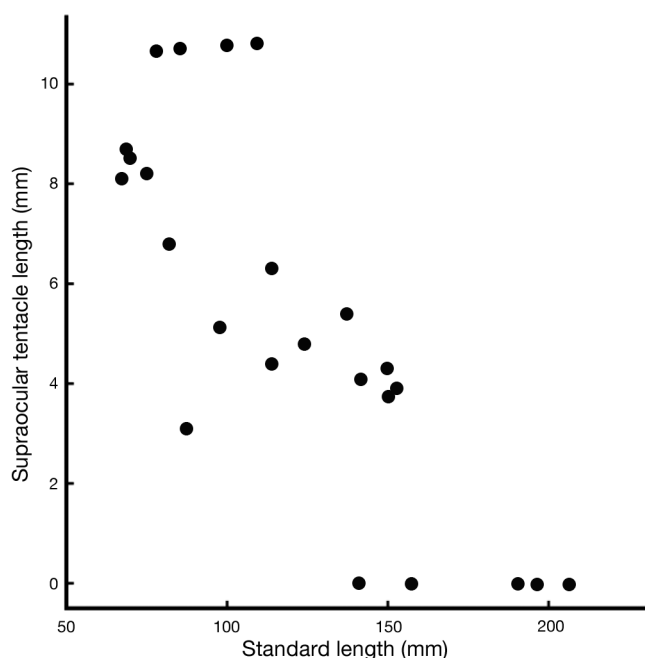


Figure 2. – Relationship between supraocular tentacle length and standard length (mm) in *Pterois russelii*, showing ontogenetic change of the former.

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